

VICE PREMIER'S VISIT—Deng Xiaoping of China toured the Space Center Feb. 2. A highlight

of his visit was "flying" the simulator in Building 5 with astronaut Fred Haise. "I am a novice at these

things, but I find them fascinating," Deng said through an interpreter.

ROUNDUP

Lyndon B. Johnson
Space Center

NASA

February 9, 1979 Houston, Texas

Vol. 18, No. 3

Orbiters christened

NASA has named the first four Space Shuttle orbiters to operate in space after sea vessels used in world exploration.

Orbiter 102, scheduled to be launched into Earth orbit late this year, will be named Columbia. Subsequent orbiters will be named Challenger (Orbiter 099), Discovery (Orbiter 103) and Atlantis (Orbiter 104).

The Challenger made a prolonged oceanic exploration cruise from December 1872 to May 1876 gathering data about the Atlantic and Pacific Oceans that filled 50 volumes. Challenger also was the name of the Apollo 17 lunar module that landed on the Moon in December 1972.

The sea-going Columbia, out of Boston, entered and explored the mouth of the Columbia River in 1792. Captain Robert Gray named the river after his sloop. Columbia also was the name of one of the first U.S. Navy ships to circumnavigate the globe and the name of the Apollo 11 command module which circled the Moon during the first manned landing on the lunar surface, July 20, 1969.

The Discovery was used to explore Hudson Bay in Canada and to search for a northwest passage from the Atlantic to the Pacific in 1610 and 1611.

The Discovery also was one of two



This solar array wing that will fly on the Shuttle in the 1980's is now being tested by Lockheed.

ships in the 1770's used to discover the Hawaiian Islands and explore the coasts of southern Alaska and western Canada.

During the Revolutionary War, Benjamin Franklin issued a safe-conduct request for the English ship Discovery because of interest in the scientific objectives of its expeditions.

The two-masted ketch Atlantis logged half a million miles between 1930 and 1966 as the first American-operated vessel designed especially for ocean research.

Black group praises JSC for raising opportunities

Recognition for the positive steps JSC has taken in increasing opportunities for minority employees came in the form of an award given for the first time by the Houston Citizens Chamber of Commerce, the Progressive Opportunity Award, at their 43rd annual meeting at the Houston Club on Friday, Jan. 26.

Astronaut candidate Guion S. Bluford accepted the award on behalf of JSC for Christopher Kraft who was out of town.

The Center was recognized for its role in leading federal agencies in the Houston area in recruitment, employ-

ment, promotion, and career development of minority professional—scientists, engineers, and administrative personnel—and for the 1978 astronaut recruiting program which included the first minority astronauts.

Organized in 1935, the Houston Citizens Chamber of Commerce is a voluntary organization of business and professional men and women representing the Black community in Houston. Current president Earl B. Loggins and the other members lend their training and experience in a number of areas of community needs, including business and economic development.

Skylab efforts continuing

Flight controllers at the space center ceased round-the-clock monitoring of Skylab on Friday, Feb. 2. Controllers will instead monitor Skylab during one eight-hour shift, five days a week. "The weekly schedule will be arranged so that Skylab monitoring includes one day during the weekend to preclude a two-day absence of coverage," said Charles Harland, chief of the Payloads Operations Division.

On Thursday, Jan. 25, flight controllers maneuvered the 78.5 ton space station from a minimum-drag orbital position to

one where the space station's solar panels constantly track the Sun. This maneuver was carried out to prepare

Skylab will be visible in the Houston sky Saturday, Feb. 10 at 5:32 a.m. traveling from the North-Northwest to the East-Northeast, and reaching a maximum elevation of 30 degrees in the Northeast.

It will again cross the Houston sky on Sunday, Feb. 11 at 6 a.m., traveling from the West-Northwest to the South-Southeast, and reaching a maximum elevation of 48 degrees above the Southwest.

On those mornings, the space station will be 226 statute miles above Earth.

Due to sudden changes in solar activity which affect the atmosphere, times may vary by a few minutes.

Skylab for a possible "last chance" maneuver just prior to the craft's reentry. "The Sun-facing attitude will take less flight control effort to maintain," Harlan said.

Repositioning Skylab from minimum drag will also speed up decay of the vehicle's orbit, perhaps allowing electrical systems to still be operating during reentry. NASA has been studying ways to alert the reentry path of the space station, although views differ as to the degree of active control that will be possible just prior to reentry.

Air pollution near Space Center does not exceed environmental agency standards

Ambient air in the Space Center area remains well within the Environmental Protection Agency national primary standards for particulate matter, a spokesperson from the Space and Life Sciences Directorate reported at a recent meeting of the JSC Pollution Control Committee.

The EPA has designated Houston as an air quality maintenance area for particulate matter—any matter dispersed in the air, whether solid or liquid, in which the individual particles are larger than small molecules but smaller than 500 microns (one micron equals one millionth of a meter).

Under the guidelines of the Na-



tional Clean Air Act as amended Dec. 31, 1970, the EPA has set down primary ambient air quality standards, defining levels of air quality necessary to protect public health. The primary standards for particulate matter are 75 ug/m³ (micrograms per cubic meter) of air as an annual geometric mean and 260 ug/m³ as a maximum for any 24-hour period.

Sampling for particulate matter was

conducted by the Environmental Health Services at JSC throughout the calendar year 1978. Analyses indicated the average concentration of particulate matter in 24-hour air samples was 28.1 ug/m³ as a geometric mean. The highest concentration for the year was 69.8 ug/m³ in a 24-hour period. The lowest concentration was 2.8 ug/m³.

Bulletin Board

Black History Month At JSC

The Space Center will present a 2-day program for the 53rd annual recognition of contributions Black Americans have made to American life and culture. This year's theme, "History: Torch for the Future," will be exemplified in events to be held in the Building 2 Auditorium, Feb. 15 and 16. The activities for Thursday Feb. 15 include the film "Heritage In Black" which presents a 200-year panorama of Black life in America and the exhibition of cultural displays.

The main program will begin at 1 p.m. Friday, Feb. 16 and feature Dr. T. F. Freeman, director of Weekend College at Texas Southern University, as keynote speaker. Cultural expressions through dramatic and musical presentations will also be included. All JSC and contractor personnel are invited to attend.

EAA Events

The Country Western Dance is scheduled for Friday, March 3, at the Rec Center. Tickets are \$6.50/person and available at the cafeteria.

Wanted: 1979 Picnic Committee Members: A Working Group is being organized to develop this year's EAA family picnic. Help is needed to plan entertainment, theme, publicity, and to provide supervision during this event. Those interested may contact Evon Collins, Picnic Chairman, x-6308.

At the JSC Exchange Store

- Dean Goss tickets - \$10.00 single, \$20.00 couple (Reg. \$14.50 each)
- General Cinema tickets - \$2.40 each
- ABC Theatre tickets - \$2.00 each
- Magic Kingdom Cards - Free
- Entertainment '79 Coupon Book - \$15.00 Deadline for obtaining this coupon book is Feb. 15. For additional information contact Bea Brown at x4814.

For the 4/15 Blues

The JSC Credit Union will sponsor a Personal Income Tax Seminar at 7 p.m. Feb. 27 in Gilruth Center, for members and non-members. Guest lecturer will be

Professor Jerry Horvitz, of the Dept. of Accountancy and Taxation at UHCC. His lecture will cover changes in tax laws that affect the individual, and he will review other aspects of tax filing that often prompt questions from tax payers.

Free Cuic Checks

The credit union is now providing Cuic Drafts (checks) without charge to members who have Cuic draft accounts and have their paychecks (or Social Security) deposited directly to their accounts. When your employer deposits your check in the CU, it is credited to your account on the day the listing is received in the CU office. As long as you continue to have your paychecks deposited in this way, you will receive Cuic Drafts from the CU without charge.



WORKING FOR WOMEN—The Federal Women's Program Committee for 1979 are (left to right): Sylvia Salinas, Sylvia White, Helen Ragsdale, Margaret Holmes, Ann Sullivan, Virginia Hughes (Chair), Carole Boudreau, Nancy Fee, and Marilyn Bocking. (Not shown: Ruth Fruland and Rae Chambers.) First order of business is Women's Week in May and committee members welcome suggestions.



GET-AWAY-SPECIALISTS—A group of Prairie View A&M students will fly a small payload on the Space Shuttle. Shown here with Jack Waite of Visitor Services, they toured JSC recently to get an overview of Shuttle operations and applications.

Songs for Science

The West Point Cadet Glee Club will perform at a benefit concert March 28 at the Music Hall downtown. Proceeds will go to the Research Hematology Laboratory at Texas Children's Hospital.

Center Director Christopher Kraft sits on the Committee for West Point, which helped raise funds to bring the cadets to Houston. It will be the first Houston performance of the 76-year-old glee club.

The day after the concert, the cadets will tour the Space Center, meeting with

Kraft, Hal Stall, and a number of astronauts.

The Research Hematology Lab is involved in treatment and research of leukemia, lymphoma, and other blood disorders in children. Ninety percent of pediatric blood disorders in Harris County are treated through this center, and TCH doctors say that after 30 years of work, treatment for the majority of children with lymphocytic leukemia is resulting in disease-free survivals, "possible even cures."

For ticket information, call Betty Jukes, 621-4548.

If you need coverage, take note

NEBA is launching the annual membership drive for its Group Life Insurance Program.

The membership drive will start in mid-February and continue through March. NEBA and Home Life Insurance Company representatives will be available in each cafeteria on Feb. 20. These representatives will answer questions and provide assistance.

All permanent employees, nonpermanent employees with an appointment of twelve months or more, and reimbursable detailees are eligible.

Coverage for spouse and dependent children is also available.

The amount of coverage for the employee is related to the individual's

It's a Fact

Americans purchased \$367.3 billion of new life insurance last year. Total coverage rose to \$2,583 billion. Both are record highs.

annual salary. Spouse coverage is either \$5,000 or \$10,000 depending on the employee's annual salary. Dependent child coverage is \$2,000 for each child.

Conversion privileges are guaranteed for all employees and spouses. Children's conversion privileges must be applied for.

If you need additional protection for your family, you should investigate the NEBA Plan.

Remember that Group Life Insurance premiums are due by the first of each quarter (i.e., October, January, April and July). A grace period of 20 days is allowed; however, all payments must be received by the twentieth of the first month of each quarter.

Insurance counseling on the NEBA plans is available on an individual basis. Please call the NEBA Office, x-5410, for appointment.

In addition to the Group Life Insurance Plan, NEBA also has a Group Life Travel Accident Plan. Should any nonmember wish to join, either or both plans, please contact the Personnel Office (Mrs. Kathryn Autery) x-2681 or the NEBA Office x-5410.

Clubs

The Lunarfin's Scuba Club will sponsor a 6-week training course in scuba diving

SPUR YOURSELF ON UNTIL WE GET THE POINT



SEND YOUR COST REDUCTION REPORT ON JSC FORM 1150 TO: BG-3 COST REDUCTION OFFICE

starting March 1. Total cost is \$65 and includes tank, air, regulator, and backpack. The Lunarfin's is an active club which promotes safe sport diving in our own Texas backyard of lakes and the Gulf of Mexico, and even organizes dive trips to such exotic places as Cozumel and the Cayman Islands. For more information, contact Rodney Rocha, 333-4606 after 5 p.m.

Take to the sky

The JSC Aero Club has several openings for new members. The club operates two aircraft—a 2-passenger Cessna 150 and a 4-passenger Cessna 172—at Houston Gulf Airport. The club is a non-profit organization and offers use of the aircraft at cost. Membership is restricted to JSC Civil Service and contractor personnel and their dependents. For information on joining the JSC Aero Club, call John Rector, x-5123. For information on the ground school or supplies, call Jackie Bohannon, x-4161.

They'll Be Telling Tall Tales

Gus Babb will represent the Spaceland Toast Masters Club at the Division Tall Tales Contest, Feb. 9, Busch Gardens Hospitality Rm. There is a social

hour at 6 p.m., followed by dinner at 7, and then the Tall Tales Contest. Tickets are \$6 advance, \$7 at the door. Contact Rudy Williams, Spaceland President, x-2254 or 486-8119.

Campers Needed

The League City Evening Lions have several openings for the 1979 summer session at the Lion's Kerrville camp. All children attend free as the entire cost of the camp is borne by the Texas Lions. If you have a child or know a child that has impaired sight, hearing, muscular or limb disability, diabetes, or other physical disability, regardless of magnitude, great or small, please contact John Love at 483-4528 for further information. Don't miss this opportunity for a child to have a great time, and at the same time grow as a person through the experience. Priority will be given to children who have not previously attended the camp.

Learn to Sail Away

Basic and Intermediate Sailing Courses will again be offered this spring. The courses are sponsored by the Clear Lake Sailing Club, the Lake Houston Sailing Club and Lido Fleet 40. For more information, call de la Garza at 488-3921.

The Roundup is an official publication of the National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for JSC employees.

Writer/Editor: Kay Ebeling
Photographer: A. "Pat" Patnesky

His work is professional

Neil Adams works in support of Mr. James Bodmer on the Instrument Pointing System (IPS). In his first quarter he was given the task to make a drawing of the IPS power control electronics. This was to be a typical flight controller systems handbook drawing. He completed the drawing during the final weeks of the quarter after he first became generally familiar with the IPS. The drawing was of such good quality that, after review, it was sent to printing virtually without correction.

In his second quarter, Adams went to work developing a timeline of the data exchange between the IPS software program and the IPS star tracker computer. Using contractor documentation, with symbols unique to the IPS, Adams was required to interpret them in terms of overall IPS operation and present the information in directly readable form. He completed the flow diagrams in time to be of use in evaluation of the IPS operation for operator display requirements. He has attended working group meetings with the European Space Agency representatives and because of his knowledge of the IPS, he has been able to contribute to these meetings.

Adams has shown exceptional interest in his work and willingness to learn. He has been quick to grasp the technical aspects of payload operations and proceeds about his work independently. Adams' contributions have surpassed those an average cooperative student employee makes, and he shows promise of being an outstanding employee.

Adams is a sophomore in Aeronautical Engineering at the University of Cincinnati.



CLOSER ENCOUNTER—Voyager I took this photo of Jupiter Jan. 24, 25 million miles from the planet. As the spacecraft draws closer, more details are emerging. An elongated yellow cloud within the Great Red

Spot is swirling in a counter-clockwise direction. Ganymede, Jupiter's largest moon, can be seen in the lower left. The Jupiter encounter climaxes March 5.
—Photo courtesy of JPL

She takes an avid interest in her job

On top of her secretarial duties, Jeanette Beck of the Shuttle Systems Integration Office has studied the total systems engineering and integration work breakdown structure. With this information, she anticipates schedule requirements—meetings, technical problems—and is frequently able to prevent delays by calling these situations to the attention of the proper office manager.

Beck maintains close contact with all test, engineering, and technical integration personnel, and she has developed techniques for summarizing and reporting daily results to the Associate Administrator for Space Transportation.

Her fellow employees say that Beck is

"intolerant of idleness and always looking for additional responsibilities to reduce the manager's work load." Personnel in Systems Integration are a conglomerate from JSC, MSFC, KSC, the USAF, and contractors. "The wide variety of forms and procedures which must be understood to provide support for such a work force would overwhelm a good sec-

retary," said Owen Morris. "Mrs. Beck executes widely varied techniques as routine functions."

From her performance it is plain that she is highly interested in the work of her office, and that interest produces consistently high quality work. So Jeanette Beck has been named Secretary of the Month for January.

What's cookin' in the JSC cafeteria

Week of February 12-16

MONDAY: Cream of Chicken Soup; Beef Burgandy over Noodles; Fried Chicken; BBQ Sausage Link; Hamburger Steak (Special); Buttered Corn; Carrots; Green Beans. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

TUESDAY: Beef Noodle Soup; Baked Meatloaf; Liver w/onions; BBQ Spare Ribs; Turkey & Dressing (Special); Spanish Rice; Broccoli; Buttered Squash.

WEDNESDAY: Clam Chowder; Fried Perch; Tamales w/chili; 8-oz T-Bone Steak; Spanish Macaroni (Special); Ranch Beans; Spinach; Beets.

THURSDAY: Navy Bean Soup; Beef Pot Roast; Shrimp Chop Suey; Pork Chops; Chicken Fried Steak (Special); Carrots; Cabbage; Green Beans.

FRIDAY: Seafood Gumbo; Broiled Flounder; Fried Shrimp; Baked Ham; Tuna & Noodle Casserole (Special); Corn; Turnip Greens; Stewed Tomatoes.

Week of February 19-23

MONDAY:

HOLIDAY

TUESDAY: Beef & Barley Soup; Beef Stew; Shrimp Creole; Veal Cutlet w/brown gravy; Fried Chicken (Special); Stewed Tomatoes; Mixed Vegetables; Broccoli.

WEDNESDAY: Mushroom Soup; 8-oz. T-Bone Steak; Fried Perch; New England Dinner; Swiss Steak (Special); Italian Green Beans; Cabbage; Carrots.

THURSDAY: Cream of Chicken Soup; Turkey & Dressing; Enchiladas w/chili; Weiners & Baked Beans; Stuffed Bell Peppers (Special); Zucchini Squash; English Peas; Rice.

FRIDAY: Seafood Gumbo; Stuffed Flounder; 1/4 Broiled Chicken w/peach half; Salisbury Steak (special); Cauliflower au gratin; mixed Vegetables; Whipped Potatoes; Green Beans.

Spreading the words

Everyone who works on site should receive a copy of *Roundup* in the mail—including on site contractor employees. Branch secretaries, please review your section. If everyone is not receiving a copy, including contractor employees, fill out another JSC Form 2271 and send it to Distribution JM86. Any questions on this, call the *Roundup* editor at x5111.



Jeanette Beck

Roundup Swap Shop

Miscellaneous

Tire: ER78X14 radial, steel belted, never on the ground, \$45. Barbara 944-1280
Basketball backboard attached to 14' iron post, ready to put in ground, \$25. R. Joosten 488-2467 after 5 p.m.
Guitar Lessons: Folk or Classical in the evenings. League City 332-2364
Black and Decker Workmate, new \$45. 482-1635
Firewood, oak, cut, you pickup, \$50 cord. 862-9813
10' X 16' Tent with canvas container, \$60.
Ruth Smith between 7:30-4:00, 483-5251
One Rohn 25G tower (4 sections), one TRA-4 Roter and AR-22R control, exc. cond. Eggleston 482-4239

Boats & Planes

25' Bayliner Sport Fisherman w/E-Z Loader trailer. Custom made teak dive playform, 307 Chevy V-8 W/Volvo outdrive., exc. cond., exc. offshore performance. After 6 p.m. 944-9563 or 452-6257
'74 20' O'Day Sailboat, 6HP Volvo Outboard w/alternator, tilt trailer, depth finder, Main, Jib, Storm Jib, fully Coast Guard equipped, exc. cond., \$4800. 486-0185
14' Fiberglass boat w/40 HP Mercury, walk-thru windshield, new battery, gas tanks, aluminum trailer, fair cond., \$750. 482-2966

Property & Rentals

Wooded waterview lot at Point Lookout on

Lake Livingston, 75 x 137, utilities, restrictions, \$3750. 946-7587

Lease: Forest Bend, 3-2-2, fireplace, fenced yard, near park \$425 mo + deposit. Charlotte Smith 488-0010

Sale: Heritage Park/Webster, 4-2-2, Contemporary, "Must See To Believe," Behind Baybrook Mall, beautifully landscaped, low 50's. 332-2279

Cars & Trucks

'76 Pace Arrow 25' Motor Home, loaded, Roof & Dash Air AM/FM Stereo w/8-track, cruise control, tilt steering plus many more options, low mileage, exc. cond. 554-2755 after 4:30

'75 Ford Elite, exc. cond., must see to appreciate, \$3150. Opal 643-7640 after 5
'76 Chrysler NY Brougha, dual 6-way power seats, sun roof, stereo, loaded, 27,000 miles, like new, \$5555. Bailey 944-3871

'75 Nova, custom, 4 dr., A/C, auto., power, new radial tires, exc. cond., \$2195. 471-3019
'72 Ventura, \$500. Norm 488-5477

'70 Wards traveler pop-up camper, weight - 900 lbs., sleeps 4 adults plus 1 child, good cond., very little use, \$650. Joosten 488-2467 after 5 p.m.
'77 Cutless Supreme, 2 dr., V-8, auto, AC, PS, PB, stereo, tape, 26,000 miles, \$4795. 482-1535

'75 VW Bus, 7 pass., auto, air, am/fm, exc. tires, exc. cond., \$3750. 332-2364

Swap Shop advertising is open to JSC federal and on-site contractor employees. Goods or services must be offered as advertised, without regard to race, religion, sex or national origin. Noncommercial personal ads should be about 20 words and include home phone number. Typed or printed ad copy must be received by AP3/Roundup by Wednesday of the week prior to publication.

'72 Gran Torino sta. wagon, PX PS, PB, A/C, 351 V-8, reg gas, 58,000 miles, repair records, shop manuals. 488-6249

Audi Fox, '75, 43,000 miles, automatic, air, sun roof, new tires, AM/FM stereo, \$3000. 486-0185

Personals

There are thousands of words in the English language. When arranged in the right manner, the sentence, phrase, or verse is beautiful. However, when trying to express gratitude and thanks, they cannot be put together better than the words "Thank you to All You Wonderful Caring People."
—Chloe Anderson and Family

Cycles

Bicycle, girl's 20-inch, Summer Blonde, \$10. 946-2523

Motorcycle, Suzuki RM80, 1 year old, exc. cond. Lousma 482-2360

Wanted

Slide Projector. Art Mandell 474-2081

Lost & Found

Lost: Three bay articulated longeron astromast demonstration unit. Contact Cioni x6491 or Moser x3076

Pets

Toy Poodle puppies, AKC reg., dark apricot, \$125-150, male and female. 334-2294

Boxer puppies, AKC reg., CH. sire, flashy brindle, male and female, \$125 - \$200. 334-2294

Dachshund, AKC standard & min puppies, all coats, Mexican & American champ at stud, standard & miniature. Carlin 645-3722

Household Articles

Corner sleeper unit, makes two twin beds, exc. cond., \$125, bed frame for twin or double bed, \$5. 485-5106 after 5:30 p.m.

Custom made Italian Provincial Sofa, Gold fabric, fruitwood, 85-inch, \$75. 485-5106 after 5:30 p.m.

1 Early American sofa, \$150, w/2 matching chairs, \$50 each. 331-8665

Magnavox AM/FM clock-radio, walnut cabinet, exc. cond., \$20. 333-2509

Gas Range, Sears Pilotless, 10 mos. old, white, like new cond., \$250, save \$100 over original cost. J. Taylor 471-2580 after 5

Misc. antiques, clocks and primitive tools, booth 26, Baybrook Mall Antique Show, Feb. 15-17

Jenn-Aire space grille, \$150; Frigidaire range top, chrome, \$60; Rangaire vent, aluminum, \$40; all used 18 months. Moore 488-4089

Sansui QS 4500, 4 channel receiver/amplifier, \$225; Pioneer, PL50 Turntable w/dust cover, \$70; Two Sansui 5000 4-way speakers, 100 watt capacity, large size, \$250 pair; AKAI 365-D Reel to reel tape deck, auto reverse, glass head, \$345; Refrigerator, Westinghouse, Frost-free, 18 cubic feet, avocado, 1-1/2 yrs. old, \$225. 486-0890 after 5

The Model T of future space cars

Backpack will give astronauts free mobility in space vacuum

The year is 1990. A crew of technician astronauts is operating remote, automated construction equipment, assembling a solar power satellite at 400 miles above Earth. There is a glitch, and one beam does not line up correctly.

One astronaut puts on a pressure suit and climbs through the airlock into the payload bay. She reaches up, grabs a handrail and backs into a Manned Maneuvering Unit. After slipping the latches into the right slots, she releases a lever and flies to the construction site. She maneuvers the beam into place and returns to the Orbiter to resume work.

Construction is still on schedule.

The 250-pound MMU described above is in research and development stages today, planned to be a regular part of Shuttle onboard equipment when the second Orbiter is ready. And it's a definite improvement.

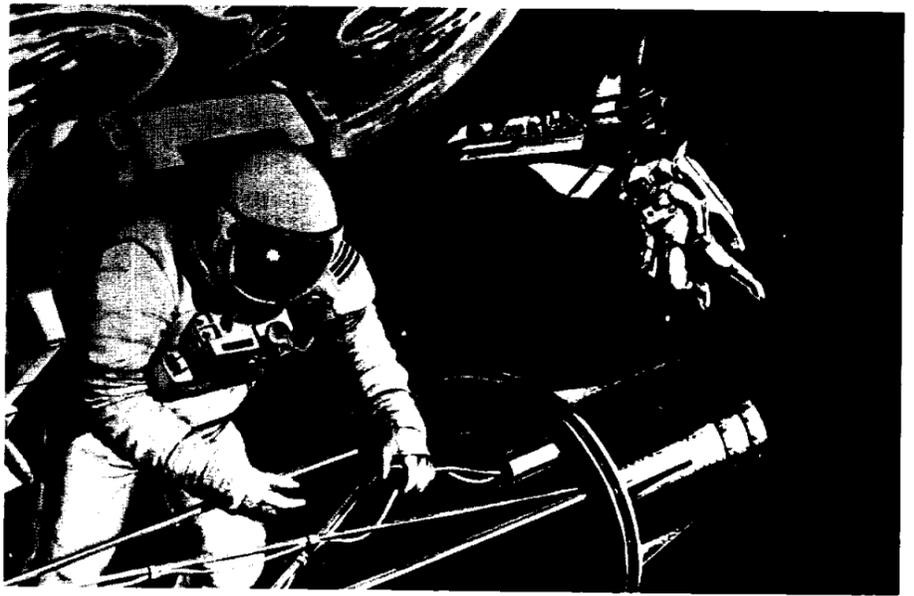
"On Skylab it would take them a long time to climb into a suit and zip all the zippers," said Subsystem Manager Ed Whitsett. "This EVA suit was designed for easy use—donning and doffing. You pull on the pants like trousers and climb into the upper

part like a sweater. Clip a ring together and you're ready to do a checkout."

The MMU is a self-contained propulsive backpack that is flown like an individual spacecraft. In it a crewmember can work in hard-to-reach areas outside the Shuttle payload bay, including thousands of feet from the Orbiter although at that distance the crew would need to use



MMU TESTS take place regularly on site in the Bldg. 260 WIF.



Artist conception of MMU in use for satellite repair

range rate information.

"At a thousand feet, you may be in a slightly different speed orbit from the Orbiter," Whitsett explained. (The higher the altitude, the slower the orbit—Orbital Mechanics I.) "You could be drifting away at two to three feet per second and not realize it. At 300 feet you have good visual cues to fly by, but at larger distances you need something like police hand-held Doppler radar."

The MMU is fail safe, designed with system redundancy. There are two separate systems of thrusters and electronics. The suit initially will be carried onboard for emergency or repair. But in the future, MMU's will be a regular part of an astronaut's uniform, worn, for example, in construction of large space structures.

"Say you are deploying the space telescope and the aperture door won't open," said Whitsett. "You would don the MMU, fly over, and manually crank it open. Since the thrusters use nitrogen, an inert gas, it wouldn't contaminate the optics or sensors."

There are 24 thrusters on the suit, arranged so an astronaut can fly in all

directions. The MMU was designed for use without an umbilical tether, as Skylab experience showed that at a distance a tether could be more hazardous than safe.

The suit will give astronauts independent mobility in the space vacuum. "You give one pulse then coast, then pulse in the opposite direction," Whitsett said.

At 250 pounds of bulk, the MMU will probably not spinoff into jet-belts for cruising down the Gulf Freeway, though Whitsett has had calls from people thinking it will. He pulls a doll from his desk, GI Joe decked out in an MMU model.

"On Earth it's just such a different flying problem," he said. "The MMU is designed for use in the zero gravity of space.

The operation may bring on memories of Buck Rogers; after all, the MMU may be the Model T of future space autos. In the 1980's MMU's will be put to use for crew transfers, carrying moderate sized cargos, access to payloads launched and operated on pallets, and construction in orbit. For now, astronauts and candidates train in a mockup suit in the Water Immersion Facility on site.

Put SSV on MLP in the SVAC—huh?

"Technical jargon reaches its apex when the most simple thought is absolutely clear to no one at all."

Jargon's Law
Sir Isaac Jargon, 1932

The language of NASA and the Space Shuttle program is English! Or is it? The program seems to be developing a language all its own, a jargon not easily understood by the American taxpayer who's picking up the bill.

The use of jargon is becoming a new art form and it should be noted that some of the most eloquent speakers of the new tongue are to be found at space centers around the country.

"After we get 102 in the OPF, we'll do some SSME chores, TPS maintenance and OIT preps. After the OIT, we'll roll 102 into the VAB and assemble the SSV on the MLP in the SVAC. Then we'll move in the CT and roll out to the pad. Once hard down, we'll extend the RSS and open the PB doors.

The guide to the rapidly developing jargon for the Space Shuttle program is the "Glossary, Acronyms, Abbreviation . . . Space Transportation System and Associated Payloads."

This 140-page booklet is the Bible of the jargoneer. But even the most proficient jargon user can get sandbagged by multiple meanings.

"PF", for example, can mean: Probability of Failure, Parachute Facility, Powered Flight, Power Factor, Preflight, Pulse Frequency, Prime Function, or Payload Forward.

"DAR" can mean Data Aided Receiver, Digital Autopilot Requirements, or Deviation Approval Request. Not to mention Daughters of the American Revolution.

"MET" means Mission Elapsed Time, Meteorological, Master Events Timer, or Mission Events Timer. Or a member of a much maligned baseball team.

And if some worthy is appointed to the SIMS Board, he has to do some real scratching to determine if he's a member of the Shuttle Inventory Management System or the Shuttle Imaging Microwave System.

And how does one explain this burgeoning barrage of esoteric terminology?

It's explained by Jargon's Law, first enunciated by Sir Isaac Jargon, PhD, QB, KBE, MC, and Resident Professor of Obscure Terminology at Harvard University, in 1932.

Jargon prefaced his profound law with this observation:

"As technical programs develop, they breed an incestuous language reducing words to abbreviations and acronyms. Program insiders learn to communicate in

this arcane tongue, expressing ever more complex thoughts with ever increasing clarity to an ever decreasing number of people able to understand them."

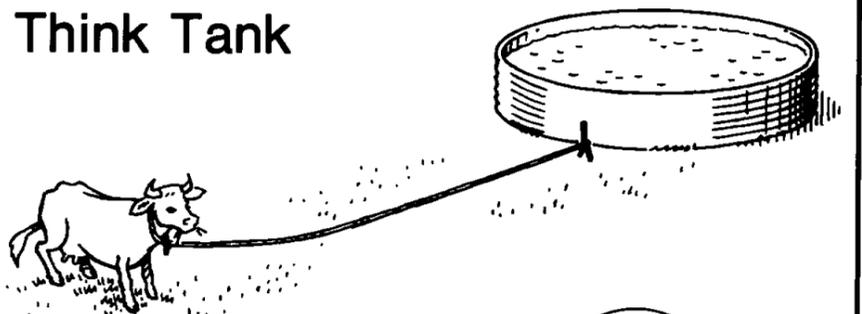
What is the message of Jargon's Law to those of us who labor in the vineyards of space? What is the meaning of this profound law?

It's to be found in Axiom 1 to Jargon's Law.

"If you want people to understand you, for Pete's sake, put it in English." □

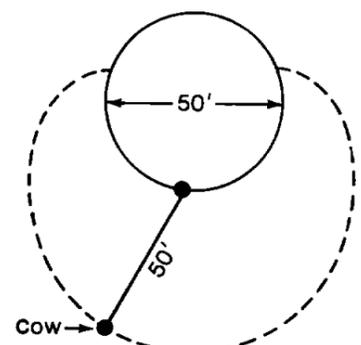
Reprinted from Spaceport News, on-site bi-weekly at Kennedy Space Center, January 19 edition.

Think Tank



A cow is tied by a 50-foot rope to the base of a tall 50-foot diameter water tank. What is the area of grass the cow can reach? (The rope wraps around the tank rather than across it.)

Send your answers to Puzzle Editor AP/3 Roundup. The best will be named in the next issue.



ROUNDUP

Lyndon B. Johnson
Space Center

NASA

February 23, 1979 Houston, Texas

Vol. 18, No. 4

Tests around site verify Orbiter & SPS equipment

It's cold and dark in Building 32, Chamber A. The environment at orbit 400 miles above Earth is being simulated by employees of Crew Systems with support from the Space Environment Test Division and contractor personnel. They are monitoring controls 24 hours a day, testing the Orbiter's Active Thermal Control System to verify design of heat collection and rejection devices and temperature control techniques.

During part of the testing, infrared lamps create heat of the sun or the heat reflected from Earth. Freon pumps through the walls. Every 90 minutes, the chamber goes through a cycle—the lights dim and go back up, temperatures change—to simulate an orbit of the Shuttle around Earth.

The ATCS will perform 3 major functions during missions: transport and control of thermal energy to and from vehicle subsystems; maintaining temperature of mechanical and electrical equipment; and vehicle rejection through radiation to Space, or evaporating stored fluids.

Employees call it "performance mapping" or "vacuum checkouts." They completed open loop testing, testing of the individual parts, and Tuesday, Feb. 20, they began closed loop testing, integration of the total system, which should be completed Feb. 23.

...

Certification vacuum firings of the Orbit Maneuvering Subsystem Engine are continuing at JSC's White Sands Test Facility in Las Cruces. Last summer the OMS pod arrived from Aerojet. Firings should be completed by the end of April and they will qualify the Pod Assembly design for the first manned orbiter flight.

...

Spacelab data processing hardware will arrive from the European Space Agency in March for testing by the Avionics Systems Division. The Data Processing Assembly will be tested for any design defects or signal incompatibilities at the Orbiter/Spacelab interface, and engineers from ESA will participate in the test work.

This is a follow-on to tests performed in the Data Systems Lab in Fall 1977. Data transfer in both system hardware and software will be evaluated in normal and anomalous operating conditions.

"Performance of hardware interfaces must be evaluated prior to Spacelab commitment of prototype designs to flight hardware," said Gene Rice of the Data Systems Lab. "Results from these tests will verify Orbiter/Spacelab compatibility or provide a basis for modification in enough time to not affect Shuttle flight dates."

Tests will take place in Building 16A, and will last 3-4 weeks, starting around April 17.

...

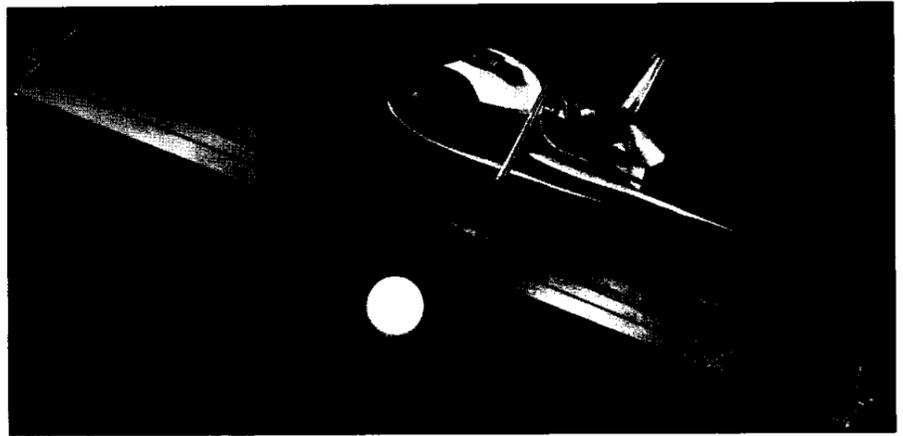
Tests of thin sheet aluminum conductors for use on solar power satellites are scheduled to be completed in March. Tests are running in Vacuum Chamber D of Building 32, with simulated space conditions. Other tests that do not require a space environment are taking place in the Power Lab or Building 16.

The scale of the JSC model depended on availability of material and space. The sheets being tested are 60 cm wide, 3 m long, and .009 cm thick. Their surfaces are anodized, or painted, and they will

carry current of up to 600 amperes in order to cover a wide range of current densities in the tests.

These distribution buses can reach widths of over 30 m and lengths over 20 km with a thickness of only 1 mm. Experience with this type of conductor is still very limited, so scale model tests will verify the concept and provide configurations for future optimizing of conductor geometry.

The first blood drive of the year will be March 6 at the Rec Center. Donors' families are eligible for needed blood for one year.



POWER EXTENSION PACKAGE, solar panels carried to and from orbit by the Shuttle, could add 22 days' life to a mission. The panels unfold to a 200m-long supplement to the Orbiter's power supply, then collapse like an accordion to fit inside the Cargo Bay, taking up no usable space. NASA recently authorized continued study of the concept by JSC. Marshall is conducting a similar study, panels pictured in the Feb. 9 Roundup that would be deployed in orbit and captured on a later mission.

NASA bringing in private sector Industries to increase role in remote sensing

In carrying out one of several actions directed by President Carter in his civil space policy statement, NASA and NOAA are jointly studying the extent to which private industry can take part in the nation's civil remote sensing program.

The two agencies are asking the

private sector to submit views on how they can increase participation, considering capital investment, system ownership, systems concepts, commercial product development, market assessments, incentives needed, and roles of the Government.

The study will consider private sector suggestions and opinions when

developing the plans and policies for private investment and participation in every aspect of remote sensing.

Submissions from the private sector should be sent to the Director of Government/Industry Affairs, NASA, Washington, D.C. 20546.

The study should be completed this summer.

Spacelab: Life Sciences experiments ready for HQ judgments

Scientists and engineers in the Life Sciences Experiments Program have completed review of 363 Spacelab experiment proposals, and are ready to submit them to Headquarters March 27. This follows 8 months of review and rating.

35 of the experiments involve JSC employees.

"There are numerous cardiovascular and vestibular experiments using both human and animal subjects among the proposals," Program Scientist Ed Michel said. "There are also many that involve plants and cellular biology."

In February of 1978, the Announcement of Opportunity went out to the scientific community, soliciting experiments to fly on Spacelab. They arrived at

NASA in June.

In July, cost and management evaluations began at JSC and Ames. A peer review panel from the American Institute of Biological Sciences rated the proposals for scientific merit and turned their results in Oct. 1. Those receiving high scientific merit went on to in-depth cost and management evaluation.

Headquarters will have final review of the experiments, probably approving 60-100, Michel said.

Using JSC recommendations, Headquarters personnel will rate the proposals into 4 categories: high scientific merit, high merit but less priority, good merit but more work needed, and rejected. Headquarters should complete its review in

June, and acceptance/rejection letters will go out that month.

Scientific objectives of Spacelab experiments are: to study human health, safety, and performance in Space; to further knowledge in medicine and biology; to use space technology and environment for solving terrestrial medical problems; and to study the origin and distribution of life in the Universe.

Typical experiments are: studying changes in crew cardiovascular condition while in spaceflight; studying the effects of spaceflight on mineral and fluid balances in the body chemistry; studying neurophysiological reactions to spaceflight; and investigations into pharmaceutical manufacturing in Space.



ASTRONAUT JOHN YOUNG, first orbital flight commander explains features of a Grumman Gulfstream II Shuttle Training Aircraft to members of the House Space Science and Applications Subcommittee during field hearings Feb. 11 at White Sands. Left to right are Larry Winn, Jr. (R-Kans), Bill Nelson (D-Fla), Young,

Don Fuqua, Chair (D-Fla), and John W. Wydler (R-NY). The group watched Joe Engle fly Shuttle landing approach runs in an STA at Northrup Strip on the U.S. Army Missile Range prior to opening the hearings. Northrup Strip is abort-once-around landing site for Shuttle tests.

Photo by Terry White

Bulletin Board

Apollo Soyuz Book Available

When *The Partnership: A History of the Apollo-Soyuz Test Project* (NASA SP-4209) was printed, the covers on hundreds of copies were damaged. The Government Printing Office required a complete reprinting of the paperback at no cost to the Government. This center has received its portion of this reissuance. Based on availability, employees of this center may send their (1) Name and (2) Mail Code on a slip in an SF No. 65-B (Mail Envelope) to Code BE-4 if they have not already received a copy of this book. NO PHONE REQUESTS, PLEASE.

Have You Forgotten Something?

The Federal Women's Program Committee recently distributed a "Survey to Determine Needs and Areas of Concern at JSC" to a random selection of 150 employees at the Center. In order to acquire valid results of such a survey, they need them returned. If you have received such a questionnaire, please complete and return it to Virginia Hughes AJ.

Wild Horses Could Tear You Away

The Clydesdale 8-Horse Team & Hitch will trot through the Space Center March 2, stopping at 10 a.m. for photographers at the Saturn Rocket parking area and then behind the Bldg. 2 auditorium. Also at 10, a hospitality van of exhibits will pull in to the area behind Bldg. 2. Key chains for grownups and lapel buttons for children will be given out, but sorry, folks, no refreshments.

Striking Out On Your Own

The Service Corps of Retired Executives and the Small Business Administration will sponsor a workshop on the "BASICS OF RUNNING A SMALL BUSINESS" at North Harris County College, Feb. 28, from 8-4:30. For further information, call 226-4945.

Aid for the April Anguish

The JSC Credit Union will sponsor a Personal Income Tax Seminar at 7 p.m. Feb. 27 in Gilruth Center, for members and non-members. Guest lecturer will be Professor Jerry Horvitz of the Dept. of Accountancy and Taxation at UHCC. His lecture will cover changes in tax laws that affect the individual, and he will review other aspects of tax filing that often prompt questions from taxpayers.

Texas Exes to Celebrate Texas Independence

To commemorate "the largest gathering ever of ex-students of The University of Texas at Austin" and Texas Independence Day March 2, local alumni and friends will hold a barbecue starting at 7 p.m. at the new Pasadena Rodeo Ground on Red Bluff Road. The public is welcome, especially people with college-age children and those interested in the University sports programs. The Dean of Students and a Longhorn coach will speak. Tickets are \$5.75 and are available at the door, or call 334-1982 for reservations. A concurrent festival will be going on that afternoon in Austin.

The flag of Texas will fly that day at the Space Center.

On Sale at the JSC Exchange Store

Dean Goss tickets - \$10 single, \$20 couple (Reg. \$14.50 each)
ABC Theatre tickets - \$2 each
General Cinema tickets - \$2.40 each
Magic Kingdom Cards - Free
The Country and Western Dance is scheduled for Sat. March 3 at the Rec. Center. Tickets are \$6.50 per person and go on sale Feb. 20.



RICHARD S. JOHNSTON, Director of Life Sciences, shown here with Al Cleveland AIAA President, received the Aerospace Contribution to Society Award from the AIAA last month in New Orleans. Johnston won the award for leadership in applying space flight technology to ground-based health care systems.



ASTRONAUT JOE ENGLE receives the Distinguished Flying Cross from former astronaut Lt. General Thomas Stafford at the JSC Honor Awards Program Jan. 29. "For piloting achievements that contributed significantly to the success of OFT," the citation reads. Over 80 employees were honored at the ceremony for Superior and Outstanding Performance and Group Achievements.

What's Going on Under the Hood?

A basic course in AUTO MECHANICS is being offered by the Gilruth Rec Center. Lectures take place March 15, 22, and 29 from 7:15 to 9:15 p.m., and there will be lab sessions Saturday, March 24 from 8-10, 10-12, or 12-2. Fee is \$15 and due March 12.

Or for those more advanced, INTERMEDIATE AUTO MECHANICS will be offered with lectures April 12, 19, 26, and May 3, 7:15 to 9:15 p.m. Labs will be April 21, 8-10, 10-12, and 12-2; and April 28, 8-12 and 12-4. Fee for new students is \$35. Former students, attending the labs only, pay \$17.50. Payment is due no later than April 9.

After the Ball You Can Disco

The JSC Dance Club is offering sessions in Ballroom and in Disco dancing. Ballroom classes begin Feb. 28 at Gilruth Rec Center. Cost of the 10-week session is \$40 a couple.

Disco dance lessons start March 6 both for beginners and intermediate dancers. Steps taught include the Night Fever, New Yorker, Victorian, and Bus Stop. Instructor is Candi Walker and the class costs \$21 a person.

To register for either class, you also pay \$1 per year per person dance club dues. Contact Lytle Jiongo, x-3445, for more information, or to register.

The Exchange Will Sponsor You

The Exchange is again sponsoring membership in the Houston Area Federal Business Association (FBA) for any Government employee working at JSC.

Membership is open to any active

federal officer or employee within a 105-mile radius of Houston.

The Association backs position vacancy sharing programs, Federal Employee of the Year Awards, a Christmas program that helps needy Federal employee families, and a local national discount buying service.

To apply, put your name, employee number, office code, and office phone number on a sheet of paper and send it to BE5; or go to Opel Loden, Marion Johnson, or the JSC Exchange Store in Bldg. 11.

How to Defend Yourself on the Gulf Freeway

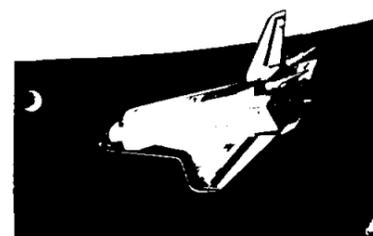
By popular demand, the EAA is sponsoring another Defensive Driving Course, to be held on March 5 and 7, or March 6 and 8, from 6-10 p.m. at the Rec Center. The Safety Council of Greater Houston provides the instruction, and cost for the 8-hour course is \$12, including materials. Sign up before March 2 (class size is limited) at the Bldg. 11 Exchange Store from 9-2, or at the Rec Center. A 10 percent insurance discount certificate will be issued upon completion of the course. Any questions, call x-4921.

It's Not Too Late to Learn Scuba Diving

The Lunarins Scuba Club is still taking names for its next class in scuba diving. Cost of the 6-week course is \$65 and it covers the instruction manual, pool fees, and use of tank, regulator, and backpack. First meeting is March 1, Room 204, Gilruth Center, at 6:30 p.m. For more information, call Rodney Rocha, 333-4606, after 5.

NEBA Fact

In 1911, the first group life insurance for employees of a particular employer was issued.



The Roundup is an official publication of the National Aeronautics and Space Administration Lyndon B. Johnson Space Center, Houston, Texas, and is published every other Friday by the Public Affairs Office for JSC employees.

Writer/Editor: Kay Ebeling
Photographer: A. "Pat" Patnesky



Photo by Carmelo Sustaita

Members of the EAA Picnic Committee stop for a photo after a work session.

Picnic Fever Rampant

The picnic committee is in high gear—working feverishly—to make this year's EAA picnic the best ever. The date

is Saturday May 5 at Camp Manison from 11-5. In keeping with this year's theme "Saturday Afternoon Fever" the band will be replaced by a disc jockey playing disco for all ages. There is enough room at Camp Manison for everyone to enjoy

their "Fever" — games for the kids, athletic events for the macho persons, bingo and entertainment in the pavillion, or a quiet shady area to sip and talk. Make plans now for May 5 and your Saturday Afternoon Fever.

What's cookin' in the JSC cafeteria

Week of February 26 - March 2

MONDAY: Chicken & Rice Soup; Texas Hots & Beans; BBQ Ham Steak; Veal Parmesan; Beef & Macaroni (Special); Green Beans; Carrots; Au Gratin Potato. Standard Daily Items: Roast Beef; Baked Ham; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches and Pies.

TUESDAY: Tomato Soup; Potato Baked Chicken; BBQ Spare Ribs; Mexican Dinner (Special); Squash; Ranch Beans; Spanish Rice; Broccoli.

WEDNESDAY: Clam Chowder; Baked Turbot; Liver & Onions; BBQ Ham Steak; Baked Meatloaf w/creole sauce (Special); Beets; Brussels Sprouts; Green Beans; Whipped Potatoes.

THURSDAY: Beef & Barley Soup; Chicken & Dumplings; Corned Beet w/cabbage; Smothered Steak w/cornbread dressing (Special); Spinach; Cabbage; Cauliflower Au Gratin; Parsley Potato.

FRIDAY: Seafood Gumbo; Pork Chops; Creole Baked Cod; Yam Rosette; Tuna & Salmon Croquette (Special); Brussels Sprouts; Green Beans; Buttered Corn; Whipped Potatoes.

Week of March 5 - 9

MONDAY: Cream of Celery Soup; Braised Beef Ribs; Chicken a la King; Enchiladas w/chili; Italian Cutlet (Special); Brussels Sprouts; Navy Beans. Standard Daily Items: Roast Beef; Baked Ham; Fried Chicken; Fried Fish; Chopped Sirloin. Selection of Salads, Sandwiches & Pies.

TUESDAY: Beef & Barley Soup; Turkey & Dressing; Country Style Steak; Beef Ravioli; Stuffed Cabbage (Special); Corn Cobette; Okra & Tomatoes; French Beans.

WEDNESDAY: Clam Chowder; Catfish w/hush puppies; Roast Pork w/dressing; 8 oz T Bone Steak; Chinese Pepper Steak (Special); Broccoli; Macaroni w/cheese; Stewed Tomatoes.

THURSDAY: Cream of Tomato Soup; Beef Tacos; BBQ Ham Slice; Hungarian Goulash; Chicken Fried Steak (Special); Spinach; Pinto Beans; Beets.

FRIDAY: Seafood Gumbo; Liver w/onions; Deviled Crabs; Roast Beef w/dressing; Seafood Platter; Tuna & Noodle Casserole (Special); Whipped Potatoes; Peas; Cauliflower.

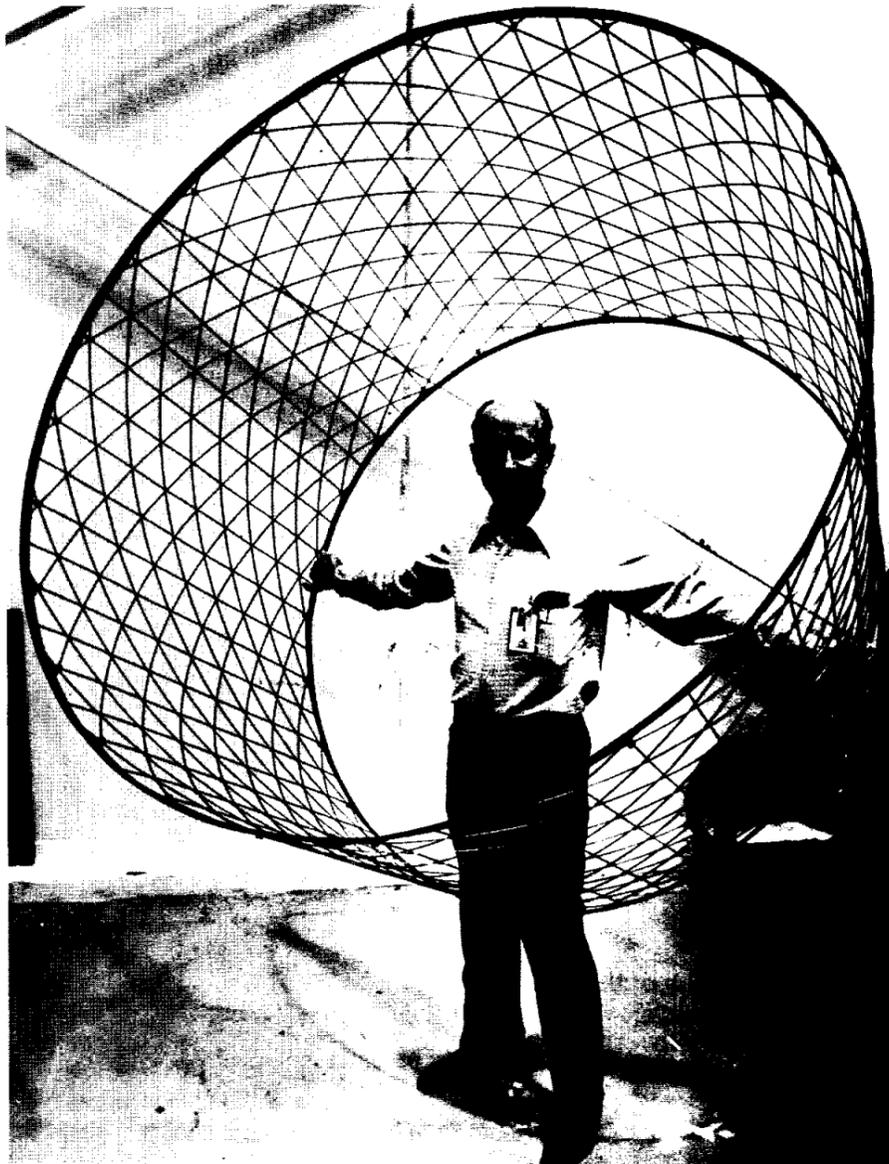


Photo by Patnesky

TOM DUNN OF STRUCTURAL DESIGN holds a small section of a demo model of a composite geodetic structure for space construction, being reviewed this month. The structure would be used in building beams 400-3,000 feet long for a solar power satellite.

A Roundup has rules, too Advice on getting it into print

So, you want to get an article in the *Roundup*. It helps if you follow these tips:

- Type and double space all copy, using a 60-character margin.
- Deadline is the first Wednesday after publication, but the sooner you turn it in the better.
- If there is a holiday in the cycle, deadline moves up one day.
- COPY WILL BE EDITED for clarity and space. If this makes you angry, you will have a chance to dunk the editor at the EAA picnic this Spring.
- To avoid editing of your crucial points, keep announcements down to 10 lines. Include a phone number of a contact person.
- Please follow instructions for turning in Swap Shop ads. Ads turned in improperly may not run.
- Photos and artwork are always welcome, and you will receive a by-line.
- Writers will also get by-lines. Call the editor to discuss your story ideas. You, too, can be an astro-journalist.

Spreading the Words

Everyone who works on site should receive a copy of *Roundup* in the mail—including on site contractor employees. Branch secretaries, please review your section. If everyone is not receiving a copy, including contractor employees, fill out another JSC Form 2271 and send it to Distribution JM86. Any questions on this, call the *Roundup* editor at x5111.

Tax Box

You can now get a tax credit for money you pay grandparents for child care of their grandchildren while the parents are out working. Under prior law, the cost of a work-hours babysitter would qualify for the credit. However, child care services by a grandparent were

generally excluded from this credit. The new law changes this. It allows a credit for payments to grandparents, as well as any close relatives of the taxpayer such as a sister, aunt, niece, or nephew. Payments to dependents or payments to a child of the taxpayer who is under age 19 do not so qualify.

Courtesy of the Federal Women's Program

Roundup Swap Shop

Household Articles

6 HP tiller, brand new; 42" attic fan, frame made to set on floor, moves a lot of air. Pettit X5491

Kenmore 4-burner gas stove, 35-1/2"-wide, large oven, A-1 cond., \$95 or best offer. M. Jones 477-3240

Nearly new round dining table & 4 matching mates chairs, antique pine finished, hardwood, extends from 42" to 66". Plastic laminated top, \$150. 474-2203

Lady Kenmore washer, \$25. 488-6095
For Sale: 17" Philco refrigerator, 8 yrs. old, \$75, good cond. Nancy 482-5607 after 5.

Small school desk, \$5; 20-inch girl's bike, green, \$10; Kiddy stop/stool, \$3. 471-3303

1930's living rm. suite, like new, sofa, cushioned chair, 2 end tables, coffee table, occasional table, bentwood rocker, \$875. 333-3279

1920's bedroom suite, bed, drop well dresser, wardrobe, cushioned chair, rocker, floor lamp, nightstand, \$585. 333-3279 after 5 pm and on weekends

Large freezer, nice, white and upright, only 1 yr. old, a giveaway at \$300. Lucie B. 641-7502

Drexel Woodbrier Dining chairs. 2 arm. 6 side, half retail price. 471-2523

Property & Rentals

Owner must sell one acre wooded lot at Beaver Creek Development, (9 mi. from Lake Somerville) Property report and map avail., asking equity, + payments of \$32 per month. Sandra Schmidt 483-4063 or 333-4379 after 5 pm

Vacation Lake Livingston Cape Royale, a beautiful resort community w/all amenities, enjoy charming custom 3-2-1 compl. furn. home nestled among trees by the water, Rent wk/mo/yr. 488-4487

Texas Veteran Land Tracts. Call 482-7697 after 5 p.m.

Cars & Trucks

'78 Tropicana 28" trailer, self contained, all extras \$6500. M. Jones 477-3240 after 5 pm
Camshaft, Dodge 340 TRW-TPI56 (St. Perf.), \$25. Drexel 471-5161

'78 Fiat X19, exc. cond., 8,000 miles, A/C, AM&FM cassette stereo, sports styling, \$6100. 488-8436

'66 AMC Rambler station wagon, 4 dr., 6 cyl, A.T, radio, heat & def., exc. cond., many new & rebuilt items, not rusted. \$500 or best offer. 488-6204 after 5 pm

'77 Olds. Cutlass Supreme, 2 dr., V-8, auto, ac, ps, pb, stereo tape, 26,000 miles, \$4595 or best offer. 482-1535

'76 Oldsmobile Cutlass Supreme Brougham, loaded, am/fm quad sound system, cruise control, etc., "the top of the line," only \$3800. Larry 487-4325 or 483-3871

'78 Camaro Z28, 9300 miles, loaded, mature owner, immaculate cond. 762-0907 between 6 and 12 pm

'69 Chevy Caprice, 2 dr. coupe, white w/black vinyl top, 325 V-8 auto. w/ac and ps, lifetime heavy-duty shocks, new 3-yr battery, new brakes, exhaust system. Ed 483-4031 or 332-3709

1978 Chevy Caprice, AC, PS, PB, AM/FM stereo, split bench seat, vinyl roof, blue/Bleu., exc. cond. 332-2291

Cycles

1974 Honda XL-250 3700 miles, \$550. Nering X7204 or 481-0608

'65 Honda CB160 motorcycle, black w/silver trim, luggage rack, new rear tire and chain. Mechanically sound and in clean cond., \$250. Ed 483-4031 or 332-3709

'74 Honda XL-175 Street legal w/helmet, \$300. Beck 482-3739

Miscellaneous

Partial bundle cedar shingles, \$5. Parker X4241

Sears wooden "Country Squire" wagon, nice for pulling 2-5 yr. olds and/or their toys, \$9.50. Merriam 488-3806

Class III trailer hitch for full size GM cars also Lodad Levelor insert with 2-inch ball. J. C. Waite 333-2442 or X4241

Tire, Uniroyal H 78-15 polyglass whitewall, like new, \$25. 333-3071

"Fawn" brand cigarette & candy machines, woodgrain front, Cost \$1000 ea., will sacrifice \$400 ea., exc. cond. 474-2203 Poindexter

HP-67 programable card-reading calculator, charger, case; exc. cond., standard + math + stat pacs, extra cards, \$320. J. Hoffman X2421

"Let's go skiing - Have plane will travel", six place airplane & pilot you pay fuel. Malone 332-1367

Discount postage: 5 percent below postoffice price, \$10.50 face value for \$10. Jeff 482-5393 after 5 pm or weekends

Ladies beautiful dark brown "Mouton" fur coat, hip length, size 12-14, asking \$50. 488-2822

Wanted: Original Gregg shorthand transcription & typing manual, Need ASAP. Herma Roth 483-2843 or 334-3484

Two int. door units, 32", new \$25 each. Drexel 471-5161

Lionel electric train set, Circa 1944-1946, exc. cond., interested in value to collector. S. Jacobs 777-2173 or X3561

4' x 8' Fredrick-Willis pool table with particle board top, automatic ball return, 5 cues and cue stand, good cond. \$100. Ed 483-4031 or 332-3709.

Van bench seat, tan vinyl, from '77 Dodge, \$30. Bays X5229 or 488-6465 after 5

Trade: \$5460 worth of land at Lake Livingston for Datsun or Toyota. 488-5445
Tow Bar, Custom built for Toyota Celica.

(Could be modified for use on other cars) Cost \$125, now \$62.50; Shelby Mags (4) 6x14 two never used, two with like-new G60 tires, \$150 all; Go Cart, \$350; 1966 VW Pan Assy, \$225; VW Trans Axel (Swing Axel Style), \$25. Underhill 334-1303 after 5

Boats & Planes

Ameagle Powered sailplane, includes wing, landing gear, and tail kits plus completed trailer. Carver X2901 or 334-1764 after 5 pm

25' Bayliner Spart Fisherman w/E-Z Loader trailer. Custom made teak dive playform, 307 Chevy V-8 W/Volvo outdrive, exc. cond., exc. offshore performance. 944-9563 or 452-6257 after 6 pm

Carpools

Wanted: Rider to join carpool leaving Meyerland at 7:20 am for the 8 am - 4:30 pm shift. Russ, X4871, Carl X4871, or Cathey X6387

Need 1 or 2 persons to complete carpool, 8-4:30, leave from Meyerland area, Southwest Houston. Paula or Theron X4660

Wanted: Carpool to U. of H. main campus from Clear Lake Area, Tues., Wed., and Thurs. nites. Rich X5841 or 474-4844

Wanted

Good used set of Child Craft Encyclopedias. Charles Shelander 729-3698

Hunting Antarctic Meteorites



In the dust-free atmosphere you can see for miles. Million-year-old ice covers the ground to the horizon, and the sky is pale, bleached. Over the ice tromps a man dressed in a thermal suit specially designed for this hostile environment. A piece of rock lies in a bed of ice. The man clamps onto it with clean, stainless steel equipment, and places it in a sterile bag.

The scene is on Earth, though the work is the study of extraterrestrial materials. NASA-JSC is applying its lunar-developed techniques of collecting rock samples to the curation and study of meteorites. Associate curator John Annexstad has just returned from a 3-month mission to the Antarctic, where 309 samples were found.

Meteorites, of course, can fall anywhere. But in Antarctica they fall on an ice system that is always moving, "a dynamic system," says Annexstad. "The meteorite is transported by the ice over millions of years. When it comes to a blockage, like a mountain

range, and the ice gets stopped, it either flows around or becomes stagnant or old. The winds strip off the snow and meteorites appear."

"We say the ice ablates—wears away," Annexstad said. The meteorites concentrate in these "blue ice" areas, "and you just pick them up," he said.

NASA's lunar landing missions provided the tools. Annexstad used stainless steel scissors and Teflon bags and gloves. "The meteorites haven't been contaminated, so we try to preserve them as best we can. We pick them up without touching them with our hands."

Annexstad and his Japanese companion, F. Nishio of the Institute for Polar Research in Tokyo, camped 40 nights 130 miles from McMurdo, living in tents. Early in the season, winds were blowing 25 miles an hour and temperatures went to 25 degrees below zero. "You wear down clothing," he said. "And use special equipment like a Scott tent. You pile

snow around the sides of the tent to keep the wind out. You sleep on three or four urethane mats. You take a Bauer bag—a thick, long sleeping bag—and put a small down bag inside. Then, if it's really cold, you sleep with all your clothes on."

Annexstad has been on 5 expeditions to the Antarctic, and he plans to go again this fall. On this trip, he traveled over 500 miles by snow machine and flew 15 hours in helicopters over the continent.

Samples they gathered will arrive

at JSC in late March or early April. Then, employees in the Lunar and Planetary Sciences Division will begin categorizing and analyzing them—further application of JSC's unique technology for handling extraterrestrial materials.

Working with Northrop contractors, NASA will unload the samples and put them in large freezers in Building 37. Then they will stage the samples—put them in clean containers and assign permanent numbers which go into a computer system.

They will use microscopic analyzing techniques. Lab workers will weigh the specimen, take a photograph, then saw it in half. They will take a small chip for a thin section and study it with optical techniques to classify the samples.

After that the real science begins. They will do a detailed study of the thin sections. Just a few of the studies they perform are measurement of radio nuclides to determine terrestrial ages, bulk chemical analysis for major elements, and investigations of the effects of cosmic ray bombardments.

The Curators' Branch publishes a newsletter about the meteorite samples. Through it, interested scientists throughout the world request specimens for detailed specific studies.

The complete program is a cooperative effort between NASA, the National Science Foundation, the Smithsonian, and the University of Pittsburgh.



Venus: An uninviting place

Early findings from the Pioneer Venus probe mission ratify that the planet is not a likely prospect for future manned missions.

New information on the forming of the inner planets, an explanation for Venus' hell-like heat, and observation of "mysterious chemical fires" on the planet's surface are part of early scientific findings by Pioneer Venus 1 and 2.

Pioneer found several hundred times more primordial argon and neon on Venus than expected, a finding that challenges

layer fades into a faint haze at about 19 miles altitude.

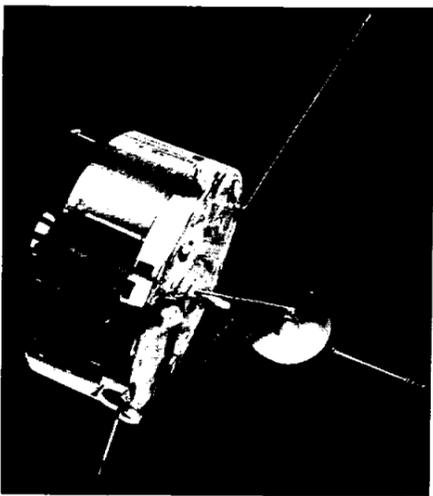
From there to the surface, the atmosphere is free of particles according to the data.

In a previously unexplored 1900-km strip on Venus' surface, much of the terrain appears relatively flat, more similar to Earth's surface than to the rough, cratered terrain of Mars and the Moon.

But there is a drop in altitude of 10,000 feet over one area 75 miles long, comparable to the drop between the crest of the Rocky Mountains near Denver to a spot in the Great Plains. More scans by the Orbiter will show a more comprehensive picture of Venus' terrain.

Starting at 13 km altitude, the two night-side probes saw an unexpected glow increasing as the probes descended. Mass spectrometer evidence suggests that the mysterious glow could come from "chemical fires" on the surface or in the very hot and dense lower atmosphere. The "fires" would be fueled by reactions involving sulfur compounds. Experimenters are considering another possibility—that the glow resulted from the heated or electrically charged surfaces of the probe craft themselves.

The findings of .1-.4 percent of water vapor and 60 parts per million free oxygen will help tell us whether Venus originally had abundant water and lost it—or never had much water. Many scientists think Venus' primordial water circulated to the top of the atmosphere where solar ultraviolet broke it down into hydrogen and oxygen. As the lightest element, hydrogen then escaped to space. (The Pioneer measurements show such low hydrogen-escape rates today that water loss, if it did happen, has long since ceased.) If massive water loss did occur this way, where is the left-over oxygen?



The Pioneer Venus Orbiter

previous theories about the forming of the solar system. The theory was that light elements (argon, neon) were swept away from the inner planets by solar winds. The fact that neon and argon are found in about the same proportions on Venus and Earth suggests a more uniform process and temperature as the solar system formed.

Near the bottom of the clouds, at about 29 miles altitude, the temperature is near the melting point of sulfur. A precloud

Annexstad gathers sample

Think Tank Results

How far can a cow graze?

We really stirred up brain dust with the last Think Tank Puzzle. 33 solutions came in: 21 followed the method described here and were correct; 6 were wrong; and 6 followed harder methods and came up with the right answer. One person made two errors but still had the correct answer.

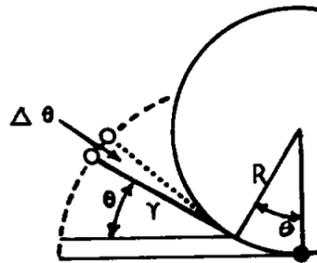
Special mention goes to **Roger Cor-**

son for coining the word "cowculus" to describe the calculations.

The best 5 answers came from **Robert Shuler, Jerry Borrer, Larry Grissom, Frank Balamonte, and Joe Thibodeau.**

The solution:

Divide the movement of the rope into a series of small angles $\Delta\theta$. Each wedge is about $1/2r^2\Delta\theta$ square feet, where $r=50-R\theta$ and θ is in radians ($\frac{\text{degrees}}{360} \cdot 2\pi$). As $\Delta\theta$ is made smaller, the approximation becomes closer, until—with an infinitesimally small $d\theta$ —the exact value can be found via the integral calculus:



$$\frac{1}{2} \int_0^{\theta_{MAX}} r^2 d\theta = \frac{1}{2} \int_0^2 (50 - 25\theta)^2 d\theta = \frac{2500}{3} \text{ Square Feet}$$

The area of grass available to the cow is then:

$$2\left(\frac{2500}{3}\right) + \frac{\pi(50)^2}{2} = 5593.66 \text{ Square Feet}$$